

### Office Action Summary

**Application No.**

10/584,342

**Applicant(s)**

SUZUKI ET AL

**Examiner**

ADAM A. ARCIERO

**Art Unit**

1795

**-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --**  
**Period for Reply**

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

**Status**

- 1) ☒ Responsive to communication(s) filed on 23 April 2009.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

**Disposition of Claims**

- 4) ☒ Claim(s) 1-3, 5 and 8-22 is/are pending in the application.
- 4a) Of the above claim(s) 13-22 is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 1-3, 5 and 8-12 is/are rejected.
- 7) ☐ Claim(s) \_\_\_\_\_ is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

**Application Papers**

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on \_\_\_\_\_ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.  
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

**Priority under 35 U.S.C. § 119**

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some \* c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
  2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
  3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

\* See the attached detailed Office action for a list of the certified copies not received.

**Attachment(s)**

- 1) ☒ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☐ Information Disclosure Statement(s) (PTO/SB/32)  
Paper No(s)/Mail Date \_\_\_\_\_
- 4) ☒ Interview Summary (PTO-413)  
Paper No(s)/Mail Date 07/16/2009
- 5) ☐ Notice of Informal Patent Application
- 6) ☐ Other: \_\_\_\_\_

**FUEL CELL DISASSEMBLY METHOD AND FUEL CELL**

Examiner: Adam Arciero      S.N. 10/584,342      Art Unit: 1795      July 16, 2009

**DETAILED ACTION**

1. The Applicant's amendment filed on April 23, 2009 was received. Claims 1-22 are currently pending. Claims 13-22 are withdrawn from consideration.
2. The text of those sections of Title 35, U.S. Code not included in this action can be found in a prior Office action.

***Claim Rejections - 35 USC § 103***

3. The claim rejections under 35 U.S.C. 103(a) as unpatentable over BREault et al. on claims 1-3, 5, 8-9 and 11-12 are withdrawn.
4. The claim rejections under 35 U.S.C. 103(a) as unpatentable over BREault et al. and IWASE et al. on claim 10 is withdrawn.
5. Claims 1-3, 5, 8-9 and 11-12 are rejected under 35 U.S.C. 103(a) as being unpatentable over MAY et al. (US 2001/0021470 A1) in view of BREault et al. (US 6,020,083).

As to Claims 1, 3, 8 and 12, MAY et al. discloses a PEM fuel cell stack (claim 36) comprising an electrode assembly having an electrolyte interposed between a pair of electrodes,

sealing layers and fuel and oxidant gas conduits (pg. 1, [0016]-[0020]). MAY et al. does not specifically disclose the location of said sealing layers.

However, BREault et al. teaches a PEM fuel cell comprising sealing layers, made of a fluororesin) located to surround the periphery of the electrode assembly. At the time of the invention it would have been obvious to one of ordinary skill in the art to modify the PEM fuel cell of MAY et al. with fluororesin sealing layers located on the periphery of the electrode assembly, because BREault et al. teaches that a strong bond between the separators and the electrode assembly is created.

MAY et al. further discloses means of humidifying both the gas and oxidant streams with a stream of water vapor (specific fluid) introduced into the fuel and oxidant streams of the fuel cell stack (pg. 5, [0081]). MAY et al. does not specifically disclose wherein said supplying of said specific fluid into the fuel and oxidant gas conduits of the fuel cell stack has a function of lowering an adhesive force of the sealing layers. However, it is the position of the Examiner that said properties are inherent, given that the sealing materials of BREault et al. and the present application, and given that the method of supplying a specific fluid (water) of MAY et al. and the present application are the same. A reference which is silent about a claimed invention's features is inherently anticipatory if the missing feature is necessarily present in that which is described in the reference. Inherency is not established by probabilities or possibilities. *In re Robertson*, 49 USPQ2d 1949 (1999).

Alternatively, it would have been obvious to one of ordinary skill in the art to add water to the fuel and oxidant streams to humidify said streams as taught by MAY et al. in order to keep the electrode assembly from drying out thereby having a reliable fuel cell.

As to Claim 2, MAY et al. discloses adding water to the fuel and oxidant streams, said water (specific fluid) is different from a fluid (methanol, oxygen) used for power generation of the fuel cell.

As to Claim 5, MAY et al. discloses adding water to the fuel and oxidant streams which are sent into conduits into the fuel cell stack (pg. 5, [0081]). Said separators which are being supplied with said streams is kept pressing during the fluid supply, because the streams being introduced into the conduits applies a force in the direction of flow to keep the separator pressing.

As to Claim 9, MAY et al. or BREault et al. does not expressly disclose wherein the water having the function of lowering the adhesive force of the sealing layers has a higher temperature than a temperature of a fluid supplied for power generation of the fuel cell. However, it would have been obvious to one of ordinary skill in the art to supply the water for disassembly at a greater temperature because it is well known that heat or higher temperatures affects the reaction kinetics of the fluororesin sealing layers in such a way so as to speed up the degradation of adhesive properties and therefore promoting disassembly of the fuel cell.

As to Claim 11, MAY et al. and BREault et al. does not expressly disclose weakening a pressing force applied in a direction of making the pair of separators approach to each other during power generation of the fuel cell, prior to said step of providing the fluid supply for disassembly of the fuel cell. However, it would have been obvious to one of ordinary skill in the

art to weaken a pressing force of said separators prior to the addition of water, so that the seal will be weaker and disassembly after the addition of the water will be enhanced.

6. Claim 10 is rejected under 35 U.S.C. 103(a) as being unpatentable over MAY et al. (US 2001/0021470 A1) and BREault et al. (US 6,020,083) as applied to claims 1-3, 5, 8-9 and 11-12 above, and further in view of IWASE et al. (US 5,718,984).

As to Claim 10, MAY et al. and BREault et al. does not specifically disclose wherein an external force is additionally applied in directions of parting the pair of separators from each other during the fluid supply for disassembly of the fuel cell.

However, IWASE et al. teaches a disassembly method of a fuel cell wherein a peel-off operation is performed (electrodes are peeled in a direction of parting from the electrolyte) (col. 9, lines 15-25 and Fig. 6). At the time of the invention, it would have been obvious to one of ordinary skill in the art to modify the disassembly method of MAY et al. and BREault et al. by applying an external force to the separators during the water supply for disassembly, so as to speed up the process for disassembling the fuel cell.

#### ***Response to Arguments***

7. Applicant's arguments, see Remarks, filed April 23, 2009, with respect to the rejection(s) of claim(s) 1-3, 5 and 8-12 under 35 U.S.C. 103(a) have been fully considered and are persuasive. Therefore, the rejection has been withdrawn. However, a new grounds of rejection is made, as shown above.

***Conclusion***

Any inquiry concerning this communication or earlier communications from the examiner should be directed to ADAM A. ARCIERO whose telephone number is (571)270-5116. The examiner can normally be reached on Monday to Friday 8am to 5pm EST.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Dah-Wei Yuan can be reached on 571-272-1295. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

AA

/Dah-Wei D. Yuan/  
Supervisory Patent Examiner, Art Unit 1795